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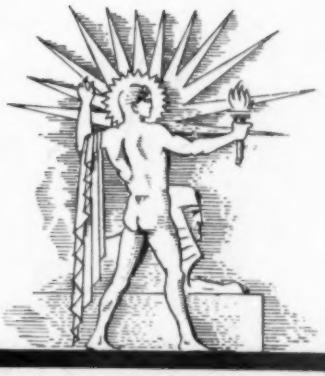
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



July 16, 1938

Weaving Light

See Page 37

A SCIENCE SERVICE PUBLICATION

Do You Know?

In early time the Beduin idea of a cup of coffee was just four sips.

Census figures show that a back-to-the-farm movement is still in progress in this country.

By aid of electroplating, metal can be given rainbow colors, including the iridescence of the soap bubble.

A British naturalist questions the popular belief that only male birds sing, for female robins, at least, can sing.

One hundred years ago, the average fleece clipped from a sheep in a year in this country weighed two pounds; today it is about eight.

Ruins of a huge theater with a stage over 400 feet long and accommodation for 12,000 spectators have been found in Syria at Apames.

British scientists are being urged to make motion picture records of English folk dances and festivals before these folk customs are forgotten.

When white men came to America, the bison were probably about as numerous as people are today—over 100,000,000 is considered a conservative estimate of the bison in those days.

To give premature infants a better chance of survival, the Children's Hospital in Cincinnati keeps an air-conditioned room for them, with temperature at 84 degrees and humidity 65 per cent.

Glass piping is gaining use in Germany, to save iron for armaments.

A Texas potato chip factory uses a washing machine to wring the water out of potato chips.

Forty kinds of antelope have been exhibited at one time or another in New York's Zoological Park.

To be happy, every member of a family needs affection, recognition, mastery of some one thing, and new experiences, says Dr. Ethel Waring of Cornell University.

Rice oil is being used for the first time in oleomargarine in the United States.

"Fire College" courses were held last year in 26 states to demonstrate the latest ideas in fire fighting.

The University of California keeps a colony of purebred cocker spaniels for its experiments with proper diets for dogs.

A noted British scientist used to visit art exhibits in order to report which pictures were good or bad in portraying clouds, lightning, and rainbows.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.*

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SCIENCE NEWS LETTER

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PHYSICS—METEOROLOGY

Weather Reports of Future May Predict Ozone Amount

Would Be of Interest to Sun-Bathers, Physicians And Farmers, For Ozone Screens Out Ultraviolet

IN THE weather reports of a few years hence there may be a line running something like this:

"Ultraviolet radiation increasing due to less ozone in the upper atmosphere; sun-bathers should expose themselves with care."

Predictions and records of ozone promise to be important not only to bathers exposed to sunshine but to physicians who use sunlight as medicine, farmers whose crops are influenced by sun energy, weather experts who must make forecasts and others.

To the American Association for the Advancement of Science, Dr. Brian O'Brien of the University of Rochester announced a new instrument that measures and records the ozone in the upper atmosphere. It may soon be standard equipment in weather stations in various parts of the world.

Ozone is oxygen in very active form and a very little of it has vast influence on the quality of the solar radiation that gets to the earth's surface. If all of it were eliminated from the air, all of us on the earth would be killed in a short time, so powerful would be the ultraviolet radiation that would be allowed to come to earth.

Yet all of the ozone in the earth's atmospheric blanket, situated mostly at an altitude of 25 miles, would be sufficient to make a layer only two millimeters thick, about the thickness of two ordinary pencil leads.

The ozone absorbs part of the solar radiation, the invisible ultraviolet area of the spectrum that lies in the neighborhood of Angstrom units.

While it was assumed in early researches that the ozone was more or less constant in amount, new work indicates that it may vary from day to day and year to year.

There may be clouds of ozone analogous to the clouds we see in the sky. These may affect weather and knowledge of them may help the accuracy of weather predictions in the future.

The intensity of the ultraviolet light is known to vary with the solar cycle, with more getting through to earth when sunspots are more numerous. Since we are now at about the peak of the sunspot cycle or a bit past it, bathers probably should expose themselves to the sun with greater care now than was necessary some years ago.

Dr. O'Brien's ozone recorder measures the ultraviolet light, charts it upon motion picture film and allows a continuous record of the changes in the ozone layer in this way. Since it costs only about $2,000 there is hope that these instruments can be scattered over the world at principal weather stations.

Science News Letter, July 16, 1938

VEST-POCKET LABORATORY

Microchemistry, a new branch of chemistry, makes use of tiny apparatus such as can be carried in the palm of the researcher's hand, for carrying out exact analysis of exceedingly small amounts of hard-to-get organic chemicals. This beaker, funnel, porcelain crucible and flask duplicate almost exactly their big brothers on laboratory shelves throughout the world. The photograph was made in the laboratories of Westinghouse.

DOCUMENTATION

Preserving Business Files Called Useful to History

THOSE files of orders, business letters, ledger accounts and other business records of yesteryear are being eyed jealously by a rather new kind of historian. There is a campaign on to persuade business men that some of their records should be kept as archives that will help them conduct their activities on a long-time basis.

Wholesale destruction of business records only a few years old is deplored by Dr. Ralph M. Hower, executive secretary of the Business Historical Society. The firms themselves will benefit from the permanent preservation of selected material. Without the records, historians will be unable to assay the course of business as an important aspect of human experience. And the public at large needs to know the history of business for if it does not its ignorance may result in the destruction of institutions and practices necessary to our present civilization.

Some business men throw up their hands hopelessly when it is suggested that their growing files be preserved. Storage space is costly and the out-of-date records are needed so infrequently. But the business historians argue that if properly handled, the regular retention of useful material, together with systematic destruction of the remaining records, will not increase office expense materially. In many cases it will actually save money and make records more accessible.

Practical suggestions for the handling of records have been compiled to guide business firms, libraries and others who wish to put the written record of commercial progress in order for the future.

Microphotographic duplication of records which has been developed in the last few years promises to allow large volumes of records to be photographed on little rolls of permanent film and stowed away in small space. Even if the original records are to be preserved in full size, the experts recommend that film copies be made as a safeguard of the originals against destruction by fire or other catastrophe.

Science News Letter, July 16, 1938

BIOLOGY

Drinking Heavy Water Brings Death or a Faster Life

When Mice Are Kept One-Fifth Saturated With Heavy Water They Are Not Poisoned; Cancers Slowed

DEATH or a faster life are the effects of drinking heavy water (deuterium oxide to chemists) instead of ordinary water, depending upon amount of heavy water consumed.

Dr. H. G. Barbour of Yale University School of Medicine reported to the American Association for the Advancement of Science experiments in which white mice die in about a week if all their ordinary drinking water is replaced by water whose hydrogen is the heavy or double-weight sort.

Ever since 1935 when the existence of heavy hydrogen was discovered, scientists have been wondering what would happen if a person drank heavy water instead of the ordinary natural kind. When a European professor drank a small amount it made the headlines a few years ago.

Until recently it was difficult to produce enough of the heavy water to use in large scale experiments.

When animals like mice are kept only one-fifth saturated with heavy water, they are not poisoned but their life processes are kept going at a faster rate, Dr. Barbour found. Chemists theorized quite the contrary because of the fact that the chemical energy of heavy water is low.

The heavy water stimulates the sympathetic nervous system, raising the hair of the animals as though they were frightened and producing pop-eyes. Dr. Barbour found that this effect is produced by heavy water protecting and preventing the decomposition of the epinephrine which is poured into the body, usually disappearing too fast to sustain these effects.

The growth of cancer in mice is slowed when the fluids of their bodies contain one-fifth heavy water, but unfortunately for any possible use of this effect the mice do not survive as long as ordinary mice with the same tumors.

A condition of catalepsy was induced in rats, cats, and a monkey by direct application of deuterium oxide to the outside of the brain. This impairment of physical and mental action is the first effect of heavy water to be observed on an animal closely related to man.

Science News Letter, July 16, 1938

ASTRONOMY

Theory of Life on Mars Is Dealt a Blow by Spectra

THE THEORY that there is life on the planet Mars is dealt a new blow by astronomical observations that show the greenish or bluish color of its so-called "seas" cannot be due to vegetation.

Dr. Peter M. Millman of David Dunlap Observatory at Richmond Hill, Ont., described to the American Association for the Advancement of Science, 200 photographs, wave length maps of the light coming from the planet, that confirm the bluish-green color seen by the eye but rule out chlorophyll of green leaves as the cause.

A favorite idea has been that the dark seas (not bodies of water) become darker with the melting of Martian polar snows and are therefore due to vegetation growth. But Dr. Millman's spectra show that the Martian seas' light is uniformly and progressively stronger toward the short or green-blue-violet end of the spectrum, whereas light from leaves is relatively weak in violet, blue and blue-green, but strong in yellow-green and yellow.

Science News Letter, July 16, 1938

ENGINEERING

New "Jet" Pulverizer Produces Finer Powder

FINER face powder, made at less cost, is one immediate application of a new super-pulverizing device which has been introduced to the chemical engineering profession.

The new pulverizer will grind particles to a size finer than the finest sieves. Particles can be obtained, economically and on a commercial scale, which correspond to 2,500 theoretical mesh, or only 5 microns in size. A micron is the scientists' unit of length which equals a thousandth of a millimeter, or about four one-hundred-thousandths of an inch (.00003937 inch).

The new machine blows particles of a material together until they attain minute size by mutual fracture. Besides finer face powder, the device makes better mineral fillers for writing paper, finer insect and fungicide powder, paint and rubber pigments and the powders which are turned into the useful and beautiful plastic products.

A sealed pancake-shaped container is the grinding unit. One-eighth inch diameter particles enter this unit for pulverizing. Multiple jets, around the peripheral wall of the chamber, shoot in streams of compressed air, or superheated steam, at pressures of from 100 to 500 pounds to the square inch.

The direction of the jets creates a rapid whirling motion of the material within and a small amount of material placed in the air jet stream, does the grinding, by impact, as it strikes the inner mass.

Because of the whirling motion centrifugal forces are set up in the chamber which move the larger particles out to the peripheral region and into the severe blasts of air. As the particles become smaller they gradually work toward the center and fall, downward and off, into a collecting receptacle.

Surprisingly enough, the tremendous pulverizing action is obtained almost without action by the confining walls of the chamber. The grinding is between particles themselves.

The new device, known as a "Micronizer," was developed from the invention of Norwood H. Andrews, by the International Pulverizing Corporation of Camden, N. J. It is not sold, but is used under license. The first technical description of its design and operation, outside of the original patent specifications, appears in *Chemical and Metallurgical Engineering*. (May)

Science News Letter, July 16, 1938

ENGINEERING

Rear-Engined Automobile Is Patented by Henry Ford

Compact Arrangement of Engine and Other Mechanism Mounted Over Rear Axle for More Direct Transmission

HENRY FORD is inventor of a rear axle engined automobile that may result in a new breed of Ford cars, it is revealed by U. S. patent, 2,123,005 just granted.

This new motor vehicle may be the realization of the long-predicted rear-engined passenger auto, with driver sitting up front enjoying an unobstructed view of the road.

The patent drawings show a compact arrangement of a V-type 8 cylinder engine, transmission, differential, flywheel, starting motor and other mechanism, all mounted over the rear axle, so as to transmit more directly the drive from the engine to the wheels.

The engine is transversely mounted on one side of the rear axle. The transmission and differential are in the center, while the engine flywheel, clutch and other heavy parts are on the other side, balancing the construction.

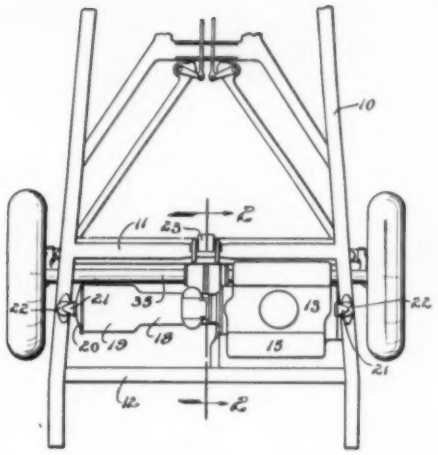
"In the past," Mr. Ford says, in the patent, "considerable difficulty has been experienced with all driving units of like nature because of the difficulties in maintaining exact alignment between the various units comprising the assembly. It is extremely costly to machine the various parts so that the axis of the engine crankshaft is exactly aligned with the axis of the transmission and driving pinion. In all other assemblies known to the applicant if such alignment is not maintained, noisy operation invariably results."

Wear in the bearings is the biggest factor in causing a shift of alignment, the patent relates.

The claim of the new patent is that the Ford engine assembly permits an appreciable amount of out-of-line displacement and still gives good operation.

Three and a half closely printed pages, intricate diagrams containing 59 numbered parts and seven claims are needed to explain the construction of the new motor vehicle.

Science News Letter, July 16, 1938



PATENT DRAWING

This is one of the drawings with which Mr. Ford made clear the specifications of his patent on the new rear-engined car.

AERONAUTICS

"Barrel" Engine For Airplane Is Smaller and Lighter

FINAL acceptance tests for a U. S. Bureau of Air Commerce rating have been completed at the Massachusetts Institute of Technology for a radically new type of airplane engine declared by its designers to be smaller and lighter than comparable engines of conventional type.

Developed by Heraclio Alfaro in cooperation with engineers of M. I. T.'s Engine Laboratory and of the Indian Motorcycle Company, the new engine is of the so-called "barrel" type. It is believed to be the first engine of this design able to meet performance requirements of the Air Commerce Bureau.

With its cylinders parallel to the crankshaft on which the propeller turns, instead of perpendicular to it as in radial and V-type engines, the "barrel" engine is one of the most compact ever designed.

Its diameter, exclusive of small protruding parts which may possibly be eliminated in later models, is but 15½ inches. More powerful models will still be much narrower than today's great radial engines, with consequent decrease of wind resistance in aviation use.

The model built by Mr. Alfaro with the help of Profs. C. F. and E. S. Taylor of M. I. T. is a four-cylinder crankless engine. It developed 115 horsepower at a speed of 2,000 revolutions per minute.

Built of cast iron and without any special effort at constructing a lightweight assembly, the engine weighs 240 pounds. Larger models with more cylinders grouped closer together and manufactured from lighter materials will produce, according to Mr. Alfaro, a liquid-cooled engine weighing slightly more than one and a quarter pounds per horsepower. A unit which he believes will develop 2,000 horsepower and weigh less than 2,000 pounds is projected.

"Wobble-plates," curving fins attached to the crankshaft, are pushed by rods on the piston rods to transmit the power developed in the cylinders. Compactness of the compression chamber and absence of hot valves allow a much higher compression ratio, making for great fuel economy, Mr. Alfaro points out.

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ENGINEERING

Light Rays Are Woven Into Strange Patterns at Show

See Front Cover

LIGHT RAYS are woven into odd patterns to demonstrate for the public how they may be controlled in an exhibit at Nela Park's General Electric Institute this year.

Lens, prism, reflector and mirror are used by the operator shown on the front cover of this week's SCIENCE NEWS LETTER to steer the light rays in any direction he desires. Criss-cross patterns and weird designs of highlight and shadow are created at will and are made striking by the element of motion.

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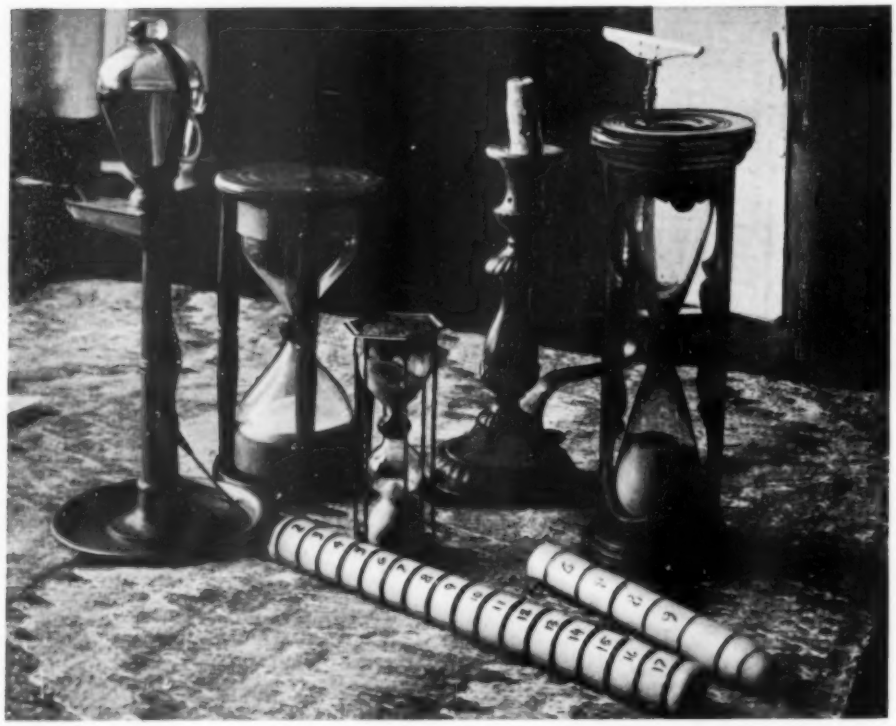

HOW TIME WAS TOLD

A few samples of replicas of ancient timepieces in the L. C. Eichner collection. At left is a clock lamp in which the falling level of the oil marks the hours. Next is a copy of an old hour glass; then an ingenious three-bulb sand glass marking hours and half hours. Behind, at the right, is a candle clock. The shadow of the bone piece is cast on a graduated hour screen. In front of the screen is an ornate, tall sand glass of old design while in the foreground are two clock candles with graduated stripings. The latter follow the time-measuring method originally attributed to King Alfred.

HOROLOGY

Modern Arts Reproduce the Timepieces of Olden Days

Sand Glasses, Water Clocks, Graduated Candles, Clock Lamps and Fountains in New Collection

MASTER craftsmanship combined with thorough engineering training is keeping alive in this bustling streamlined civilization today the art of making modern copies of the myriad devices man has used during his history for keeping time.

A collection of replicas of timepieces ranging from the water clocks of ancient Egypt to the famous pendulum clock Galileo designed but never built, assembled for the meeting of the Horological Institute of America, the watchmakers' professional society, reveals the history of time-keeping and of the perpetuation of ancient crafts.

Built by L. C. Eichner of Bloomfield, N. J., devices such as clock candles, multiple bulb sand glasses telling quarter hours, elaborate sundials, water clocks, lamp clocks, and all other devices which man through past time has used to record time's passing, are included.

Pride of the collection, perhaps, is a primitive looking pendulum clock mechanism faithfully made from original drawings left by Galileo. Clocks made from Galileo's famous clock drawings have been produced before to show that they actually would work, but machine-tooled gears and other parts were employed. The Eichner clock of Galileo is fashioned by hand after methods used in Galileo's day by locksmiths, the craftsman family from which watchmakers have descended.

Another favorite of the horologists is the great "two-hour" glass which duplicates the famous pulpit sand glass now in the Salem, Mass., museum. The forebearers of America's first families had to sit through sermons watching the sands of this glass trickle all-too-slowly to the bottom. And then perhaps the preacher would turn the glass over and start again!

Wind-Blown Sand

But these modern sand glasses contain no ordinary sand. It must be wind blown, and rounded, so that it does not clog in going through the tiny orifice between the bulbs.

The sand particles must neither be too fine nor too large. Stock rule of old sand glass makers was to screen the sand 20 times, but modern improvements in screens have led to satisfactory results with fewer operations.

The glass of the Eichner sand glasses, too, gives the appearance of antiquity for it contains strains of tiny bubbles which characterize the work of older glass blowers. Actually the glass maker fabricating these authentic reproductions uses the poorer glass that comes to the top of the pot in the melt.

King Alfred is credited with the invention of the candle clock and Mr. Eichner has several in his collection. These candles, by their burning, gradually melt away the wax which is marked at equal intervals to record the passage of equal intervals of time. In this invention King Alfred was merely using an old trick of the ancient Chinese of twisting grass into a rope and placing equally-spaced knots in the rope. Sleepers who placed such grass rope between their toes were awakened by the heat; the first alarm clock!

Sundials were the standard time keepers of the daylight hours of past generations but after dark the hour lamps came into use. These lamps marked time's passage by the lowering level of oil in their glass reservoir. Time graduations on these lamps start at 4 p. m.

Mr. Eichner has constructed several varieties of water clocks for his collection. Originally water clocks came from Egypt and the Greeks called them clepsydras. The simplest kind was merely a vessel with a tiny hole punched in the bottom which was floated on water and gradually filled until it sank.

A variation of this principle is employed by engineer Eichner in his "hour fountain" in which water runs from a top reservoir, down hollow legs supporting the reservoir, into the bottom where it bubbles up into a tiny fountain. When the fountain stops an hour has passed and the device is inverted to repeat its operation.

Such devices are time measurers, keeping track of time in units such as hours. Time keepers like clocks and watches give a continuous record of the passing of time. Such a variation of the clepsydra is also in the Eichner collection.

Mounted between two tall pedestals is a hollow drum into which is sealed water and a series of baffles with tiny openings between them. Cords wind around the axis of the drum. The drum is set at the top of its track and the water, passing from one section to the next, through the baffle system, gradually makes the drum rotate. This rotation unwinds the cord and gradually lowers the whole drum. The position of the axis of the drum, at any time, marks the hour and the motion is also transmitted to an orthodox set of hands on a clock face.

Electric clocks, keeping their marvellously accurate time, are appreciated by Mr. Eichner but he has little sympathy with modernistic, streamlined cases. Such clocks do not fit in dignified, period-type living rooms, he believes. Therefore he specializes in the fabrication of period-type electric clocks which look hundreds of years old but keep time in modern, electrical fashion. Prize of these old-new electric clocks is in the Architects' Club in New York City.

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CHEMISTRY

Nation's Soybean Lab Develops 36 Varnishes

IT IS just a bit more than a year now since active work on most of the projects at the government's Soybean Laboratory at the University of Illinois got under way. And in that year America has been diligently trying to learn about soybeans.

Thirty-six different varnishes containing 100 per cent. soybean for their oil content have been developed and are now undergoing exposure tests to determine their aging properties, according to Dr. Henry G. Knight of the U. S. Bureau of Chemistry and Soils reporting in *Industrial and Engineering Chemistry.*

The acid, alkali and water resistance of many of these oils is excellent, adds Dr. Knight, who urges that some of them appear to justify their immediate use for certain purposes. All that needs to be realized by the user in applying the new soybean varnishes is that their drying time is not as rapid as the super-quick lacquers which are so popular.

The work of the soybean laboratory is, in many ways, a race with increased production of soybeans by the American farmers. In 1926 only 2,646,000 pounds of soybean oil were crushed. In 1937 the crush will be near 200,000,000 pounds when final figures are compiled.

Soybean oil, oilmeal, soybean flour and other food stuffs are some of the products of the soybean tree. Among its industrial and food uses are: paints, enamels, varnishes, printing ink, linoleum, plastics, shortenings, margarine, foundry cores, livestock foods, flour, soy sauce (chop suey, remember), dietic foods, infant foods and beverages. From the protein content of soybeans a leading automobile manufacturer is now making a synthetic fiber quite comparable with the Italian trick of using the protein in milk casein for the same purpose.

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CHEMISTRY

Risk From Poison Gas Less Than That From Automobiles

Masks Are Safe, and Chief Peril Is From Panic, Chemist at University of Edinburgh Declares

CIVILIANS in future wars in England and the United States will run less risk from death by poison gases than they do today from death by motor car accidents.

This is the dash of "cold water" of scientific analysis which is poured on speculative imagining of death from the air by Prof. James Kendall, professor of chemistry at the University of Edinburgh, in his new book, "Breathe Freely! The Truth About Poison Gas," (Appleton-Century).

Without condoning air bombing by gas and high explosives, Prof. Kendall, who formerly was professor of chemistry and dean of the graduate faculty at New York University, seeks to show that the risks from poison gas are much less than the alarmists would have an almost hysterical England believe.

All stories that some new super gas will pass through modern gas masks are nearly 100 per cent. wrong, says Prof. Kendall.

"There is no such animal now, and there never will be," he states, explaining that the activated charcoal in the masks absorbs all molecules of any heavy vapor immediately and it will work for lighter vapors—like chlorine and phosgene—for appreciable periods of time. The filter materials of modern masks will stop all particles of smoke, even those microscopic in size. The only substances which will pass through masks are already known, but all of them are useless in chemical warfare.

The biggest point about gas attacks is that they tend to produce fear, says Prof. Kendall. The danger of fear is that it may lead to panic and it is panic which is really the major thing man has to fear from gas attacks.

Records of the World War show that the casualties from gas were much less than from high explosives and the chance of escape of civilians from high explosives in war-time is "about as good as that of losing the Irish Sweep if you are misguided enough to take a ticket therein," adds Prof. Kendall.

Civilian populations can live with gas attacks in war-times just as they live today with the motor car menace. He quotes General Ashmore, who said, "If you dash down into the Tubes at the mere threat of an air-raid, then, to be logical, you should climb a tree every time you see a motor bus."

The difference, as Prof. Kendall explains it, is that man understands a motor car and it has little mystery about it even though it deals large quantities of death each year. But mystery surrounding poison gases is something else. It is this mystery which Prof. Kendall attempts to dispel.

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POPULATION

Swedish Commission Issues Report Forbidden by Law

THE REPORT of the Swedish Population Commission, an official government body, is itself in clear violation of a still-existing Swedish law forbidding birth control information, it was revealed by Prof. Gunnar Myrdal, economist member of the Commission speaking before the graduate school of the U. S. Department of Agriculture.

Although realizing that the spread of birth control information would have as an immediate effect the even more rapid decline in an already alarmingly low birth rate, the Commission nevertheless believes that repeal of the laws hindering sale of and propaganda for contraceptives is essential to the building of a desirable quality in the population, Prof. Myrdal indicated. Comprehensive sex education in the schools and for adults is proposed by the Commission, he said. A handbook on birth control methods is an appendix to the Commission's report.

"The Commission sees in these reforms an act of human honor and truth," Prof. Myrdal said. "To have laws that contradict people's normal behavior and personal beliefs is said to be a way of undermining the morals of the nation. Such laws therefore counteract their own aims.

"Only when this whole field is cleansed of public hypocrisy, when birth control is declared to be good in itself, and thus the natural advantage of rational means over less efficient or damaging means is admitted—only then will it be possible to fight successfully by truthful education and social reforms the extreme extension of birth control which is now endangering the happiness and well-being of the individual family and the survival of the nation."

Science News Letter, July 16, 1938

GENERAL SCIENCE

Industry Needs Basic Research for Growth

RESEARCH is one of the most used, and most abused, terms in the English language today. Dr. Karl T. Compton, president of Massachusetts Institute of Technology, has defined it—in its simplest terms—as the application of all available knowledge and techniques for the systematic search for new knowledge.

One of the hardest jobs of scientific leaders is to convince industry, at least large portions of it, that research pays in the long run and that new knowledge is the springboard from which is launched future progress of the nation; industrial and otherwise.

One of the commonest short-sighted habits of a company is to apply what is called research to improve existing products, while, at the same time, basic long-range research is neglected.

In a recent address Dr. Compton presents the difference in the two pictures. Suppose a hundred years ago, he said, an industrial laboratory has set out to develop more efficient types of lamps. It would have studied flames, oils, wicks, chimneys and so on. But it almost certainly would not have studied magnets, the properties of metals, electrical currents and high vacuum.

Yet it is out of such studies in pure research that have come modern lighting and communication by wire and radio. The King of England is once said to have asked Michael Faraday of what use were his experiments with compasses, magnets and wire. To which Faraday replied, "Your Majesty, of what use is a baby?"

In many ways applied research, making present things better, is comparable with doctoring a grown man already in, or past, his prime. Fundamental research produces the "new baby" which may turn out to be another genius, or intellectual leader; or—to keep the analogy straight—another new, powerful industry.

Science News Letter, July 16, 1938

PHYSICS

New Harvard Device Enables Fast Count of Cosmic Rays

A DEVICE enabling the fastest and most accurate counts ever made of cosmic rays and other particle radiation has been developed in Harvard University's physics laboratories by Dr. E. C. Stevenson, instructor of physics, and Dr. Ivan A. Getting, junior fellow.

With the new instrument, technically known as a scaling circuit, random electrical impulses coming only a fifty-thousandth of a second apart can be distinguished and counted. The circuit is so stable counts can be made at these terrific speeds for months on end without any effective changes in the equipment.

The device was designed for use in a long-range program of counting millions of cosmic rays daily recently undertaken at Harvard. No mechanical counter is fast enough and previous electrical circuits were either too slow or too unstable.

Science News Letter, July 16, 1938

IN SCIENCE

ENGINEERING

Air Conditioning Expanding But Still Home Luxury

AIR CONDITIONING, which to most of us means air cooling, is particularly appealing in hot summer weather, when a cooled restaurant, movie, or Pullman is a refuge against the heat. On a hot day we wonder how soon science will make bearable weather for all offices, stores, factories and homes.

The problem is largely economic. The recession, as well as the heat, might be considerably relieved if all who wish it could afford to have air conditioning installed. At that, it is a business that will probably gross a hundred million dollars this year.

For some industries, air conditioning is no novelty, for in textile manufacturing, cigarette making, candy factories and other similar fields, regulation of temperature and humidity has become a technologic and economic necessity. Stores find that customers are more willing to buy if they are cool and comfortable. Theaters have increased rather than decreased business in very hot weather.

For homes, however, air conditioning is still in the luxury class. It has been estimated that with currently available equipment, the full cost of complete year-round air conditioning for a $10,000 to $15,000 house, with no further charge for heating water, may average about $25 a month, including capital charges, over and above the cost of heating alone. For cooling a single room, however, self-contained or "package" units are being made cheaper and more practical.

New buildings are more easily air conditioned than old ones. Lower ceilings are possible, windows can be reduced, ducts for air can be made integrally a part of the structure.

Increased use of cooling water due to air conditioning is causing some concern among city officials where water and sewer systems are inadequate or overtaxed. But cooling towers allowing reuse of water may overcome this difficulty.

Science News Letter, July 16, 1938

The apple is believed to have no less than 500 insect enemies.

ICE FIELDS

PHYSIOLOGY—PSYCHOLOGY

Auto Accidents Ascribed To Effect Of Noise On Eyes

ASCRIBING automobile accidents on highways to the effect a loud noise such as a muffler cut-off has on the driver's tired eyes may sound pretty far-fetched to you, but members of the American Neurological Association heard this explanation suggested by their president, Dr. Charles A. Elsberg of the Neurological Institute, New York City.

The explanation lies in the fact that the brain acts as a whole with very little isolated activity by one part or another. Each brain process, moreover, is influenced by many other brain processes. Brain wave studies have shown this to be the case, Dr. Elsberg said, and so have some of his own researches on the special senses such as hearing and vision.

You know how, when you want to hear a faint sound or smell a faint odor, you shut your eyes. The reason, Dr. Elsberg pointed out, is because of this influence the special senses like seeing and hearing have on each other. Dr. Elsberg has been able to test this influence quantitatively. He found that a person needed more light in order to see an object after hearing a loud noise or smelling some strong odor than he did before such stimulation to hearing or olfactory sense.

Getting back to the highway accidents, Dr. Elsberg said that if a person "is using his vision up to the limit of its capacity, and a truck with a muffler cut-off is passing him, the loud noise will influence his vision which is already taxed to the fullest degree. As a result he may not be able to judge distances as well, and in an emergency he may have an accident."

Earlier diagnosis of brain tumors may result from the sort of tests of the special senses which suggested the explanation for some highway accidents. If the tumor is located in the part of the brain which functions when we smell things, for example, the smelling function may be disturbed or interfered with. This may happen and be detected before the tumor has caused a change in the shape or size of the affected part that could be detected by X-ray pictures after air or oxygen injections.

Science News Letter, July 16, 1938

PHYSICS

Greatest Invention Would Be Control of Gravitation

TO THOSE who look with amazement upon such new scientific developments as television, airplanes, air-conditioning and a thousand other wonders, there may seem to be little for the inventors of the future to do.

Nevertheless the development of research and the perfection of new materials tend, to accelerate the technical progress of the future. Limitations may be imposed by dictators, wars and social disorganization. Shortages of energy, raw materials, and changes in natural conditions do not seem important in stemming inventors' progress, in the near future.

A British engineer, F. O. L. Chorlton, has attempted to look into the future of invention. He sees transport on land, water, and in the air, as the most interesting field for invention. There may be steam power for the larger airplanes.

He suggests we may even be able to control gravitation in the same way. Such a revolutionary invention would probably have a greater effect on the conditions of human life than any previous discovery.

Transmission of power in bulk through the air will probably come to pass, he predicts. Beams of energy would be radiated along each air line and airplanes would not need to carry gasoline.

In power production, probably the main improvement will be in the utilization of other liquids than water or steam for the transmission of the energy of the fuel to the revolving motor. Mr. Chorlton sees production machinery becoming more complicated, within the limitation of human capacity to control it. Entirely automatic production of our daily needs will come more and more into use until only a very few hours of work will be required from each individual.

Radio will be improved until we shall be able both to see and to speak to anybody in any part of the world. Electric lighting will improve in color and efficiency. Some control of the weather on a large scale may even become possible through the invention of special apparatus.

Science News Letter, July 16, 1938

INVENTION

Electrical Generation and X-Rays Greatest Discoveries

FARADAY'S discovery of electromagnetic induction was the most important event of the nineteenth century, declares Dr. Arthur H. Compton, University of Chicago Nobelist in physics.

Why? "Empires would fall apart, society would become disorganized, if the electrical machines based on Faraday's discovery were put out of commission."

The discovery of X-rays by Roentgen in 1895 is perhaps the greatest event within the lifetime of persons now living. What could be of more purely academic interest than extending the spectrum of electromagnetic radiation to a thousand-fold shorter wave-length?

Dr. Compton compares the consequences of Roentgen's achievement with the dramatic events of the World War.

First consider death, he says.

Such data are hard to find. The war lords do not want them advertised. In the World War there were about 8½ million soldiers killed in all the armies, one-fourth of the able-bodied men now living in the United States and Canada —a tremendous slaughter.

Yet of the 450 million people then living in the countries at war, Dr. Compton points out, some 50 million will have died of cancer. The lives of some three million others will have been saved from cancer by the use of X-rays and the radium which was discovered as a result of X-rays. If you add to these the considerably greater number whose lives have been saved by the X-ray diagnosis of tuberculosis, a broken bone or an infected tooth, it becomes evident that even in the warring countries X-rays will have saved as many lives as were taken in battle.

X-rays have also had their great economic and political effects, not so dramatic as those of the war, but perhaps even more far-reaching. What does it mean to the economic and political life of the United States to be integrated by radio? Yet without X-rays, no radio. For the radio is the child of the electron, and the electron owes its recognition to the ionization of the air by X-rays. Similarly, were it not for X-rays we should not now have sound movies or long distance telephony, or radio beacons to guide air mail, or a multitude of other devices that rely upon electrons for their operation.

Science News Letter, July 16, 1938

The ground over Mammoth Cave, Kentucky, is a bird sanctuary.

ANTHROPOLOGY

Cradle of Race Rocked by War

Hostilities Rage Where Earliest Known Human Once Walked Erect, Knew Fire, and Made Stone Tools

By DR. FRANK THONE

WAR'S FLAMES, flickering across the plains of China, are shedding their weird light on the original home of the whole human race.

Ancient Peking Man, *Sinanthropus pekinensis*, is the oldest of known human races, and stands in the direct ancestral line of modern man, declares Dr. Franz Weidenreich of Peiping Union Medical College. Dr. Weidenreich is now in this country, studying remains of other ancient races in American museums, consulting with fellow-scientists, and lecturing before learned societies on new discoveries about this First Citizen of the ancient world.

Dr. Weidenreich sees Peking Man as directly ancestral to Neandertal Man, now known from a considerable number of places in the Old World. And he agrees with a noted American fellow-anthropologist, Dr. Ales Hrdlicka of the U. S. National Museum, in regarding Neandertal Man as ancestral to the modern human race. He considers the much-disputed *Pithecanthropus erectus* of Java to be a Neandertaloid race, and probably considerably less ancient than *Sinanthropus*.

While Dr. Weidenreich makes known to occidental science the newest findings about Peking Man, his Chinese and European fellow-workers back home in Peiping are getting into the field for another season's digging for still more facts. War has not stopped their operations. The Japanese occupation of Peiping and surrounding territory last year took place so swiftly that no general destruction occurred. Since then, the Japanese authorities have not interfered in any way with the research.

As Usual

The only thing that Dr. Weidenreich fears is a possible flareup of bandit operations or guerilla warfare in the neighborhood of the caves, in the hills outside the city; but thus far nothing of the kind has threatened. In any case, the exploration of Peking Man's home is going on this summer as it has during past years.

In the laboratories in Peiping itself, the latest notable step in the study of this ancient race has been the reconstruction of a complete skull of a *Sinanthropus* woman, and the restoration over that of the features of this possible nth degree great-grandmother of our race. The work was done by Mrs. Lucile Swen, an American sculptor living in Peiping, under the direction of Dr. Weidenreich.

In making her portrait head of Peking Woman, Mrs. Swen first had to put her skull together. Several of the Peking skulls appear to be those of women, but they were all in fragments and none of them was complete. However, by taking pieces from several different skulls, it was possible to build a composite without filling in with any imaginary parts at all.

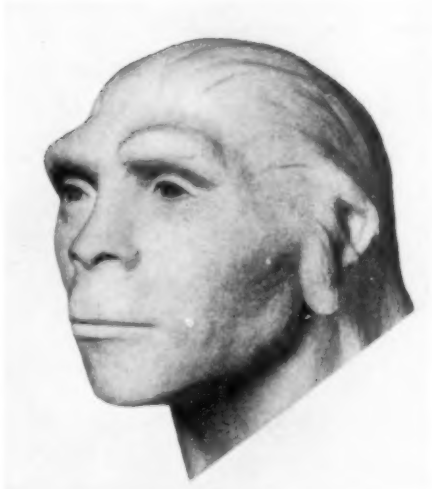
Having got her skull together, the American artist proceeded to clothe it with flesh and skin and hair. This was done by laying modeling clay over the skull cast, to thicknesses suggested partly by the tissue depths on modern Chinese women's heads, but more by the marks on the skull that showed where muscles had been attached.

Powerful Muscles

For example, it was necessary to give Mrs. Sinanthropus a tremendously thicker neck than any present-day Chinese woman has. Both the back of the skull and the powerful, chinless jaw showed areas of muscle attachment that made such a neck undeniable. Similarly, the cheeks had to be shaped in conformity with the dictates of the muscle masses needed to operate that heavy jaw. Eyebrow ridges were tremendously heavy on the Peking race, even on their women.

Peking Woman's nose was unquestionably low-ridged and flat: the longer, wider opening in the facial region of the skulls indicates that very clearly; and there is very little bony support at the top of the nose.

Partly concealed by the hair which the artist supplied is the low, flat arch of the skull, tremendously inferior to that of present-day skulls of Chinese and all other races. The widest part of the head was not near the top, as it is with all of us moderns, but low down and near the back. Also, the sides slope inward from the base upward, whereas in modern skulls the slope of the side walls is outward.



PEKING WOMAN

Reconstruction of the head of a woman of the Peking Man race, based on the skull, made under the direction of Dr. Franz Weidenreich by Mrs. Lucile Swen, American sculptor residing in Peiping.

Peking Man is able to offer a whole headfull of reasons for being regarded as the most primitive of known human beings, Dr. Weidenreich points out with both description and illustration.

Strong evidence is the arch of his skulltop, from front to back. It is the flattest, most gorilla-like, of all known human skulls. It is even flatter than one of the two Pithecanthropus skulls from Java—though admittedly the forehead is a little higher.

Gorilla-like, too, is a sharp notch found between forehead and the heavy ridge of the beetling eyebrows. This feature is far less pronounced in either Neandertal or Pithecanthropus skulls.

A character intermediate between the apes and present human races is the position of the opening through which the spinal cord passes. In apes this is at the back of the skull, pointing outwards. In modern man it is well under the base of the skull, pointing upwards. In Peking Man this opening is just bare-

ly under the base of the skull, and is visible from the back.

The brain within that peculiarly shaped skull was quite small, but still definitely within the human size range. Its volume amounted to 1,000 cubic centimeters (a little over a quart) on the average; the largest Peking skull thus far collected has a capacity of 1,220 cubic centimeters. Modern man averages 1,350 cubic centimeters, and the skull of Neandertal Man (surprisingly enough) may be able to hold even more—as much as 1,425. The smallest known Neandertal skull has a capacity of 1,290 cubic centimeters, or 90 more than the largest known Peking Man skull.

Brain Measured

Several of the nine skulls thus far collected were whole enough to permit casts to be made within their skull-cases, so that we know the size and shape of the brain as well as its total volume. It is a singularly small and flat brain, with several structures that strongly resemble corresponding ones found in the brains of apes. The front part particularly, supposed to be especially concerned with real thinking, is not nearly so fully developed as it is in present-day human beings.

Jaws and teeth, no less than skull and brain, argue for the primitiveness of Peking Man, Dr. Weidenreich said. Apes have jaws with teeth arranged in a narrow horseshoe arch, and so has this ancient human of China. Modern man has a dental arch with relatively smaller and weaker teeth, but it is wider across the back and flatter across the front.

The teeth, too, tell of primitive development. They are all big—in some instances bigger than comparable teeth in apes. The molars were all of the same size, whereas in modern man the third molars, or wisdom teeth, are smaller and sometimes fail to develop fully at all. The eyeteeth, though not such fangs as one sees in gorillas, were noticeably bigger and very much longer-rooted than the corresponding teeth in our own jaws. The crown-patterns of all of them, and especially those of the molars, were more complex than those of modern man, and more like those of apes, both modern and extinct.

One feature of these big, primitive teeth will be eyed enviously by all of us moderns, with the sole exception of the dental profession. Not one of the 148 teeth and 13 lower jaws of Sinanthropus thus far discovered shows any sign of caries, pyorrhea, or any other tooth troubles. This is admittedly not a large sample, yet it would be practically impossible to assemble a random collection of 148 modern teeth without at least some cavities.

For all his primitiveness, Sinanthropus already had some traits found in modern men, and especially in the modern men of his own homeland. A peculiar shovel-shape of the incisor teeth, and a roof-like ridge along the top of the head, are Chinese features found in both present and ancient inhabitants of this part of Asia. The same kind of a ridge marks the skulls of Eskimos, Australians, and American Indians. There are some other skull features held in common by Peking Man, modern Mongolians, and certain other peoples believed to be related to the Mongolian stock.

It is a little awesome, to think that the proverbially persistent Chinese may actually have persisted in that one place for five hundred thousand years!

The most recent find proves that Peking Man walked fully erect, like a human being, not stooping over or shambling, and certainly not using his hands as organs of locomotion. Bones other than skulls were exceedingly rare from earlier finds, but just before Dr. Weidenreich sailed for America one of his colleagues dug up a nearly complete thighbone and fragments of two other leg bones.

Shape and size indicate erect posture, and suggest that the owner was a woman. If that was really the case, then the ancient Peking race had full human stature as well; for estimates based on the length of the thighbone indicate a height of about five feet four inches.

Another thing these new leg-bone discoveries suggest, in confirmation of a theory already held on account of the broken condition of all the skulls thus far found. The leg-bones had been cracked open, and were blackened by exposure to fire. Peking Man stands accused of having been a cannibal.

But perhaps too much has been made of this cannibalism indictment. After all, Mr. and Mrs. Sinanthropus had to eat something besides each other and the neighbors. Bones from their ancient feasts are buried in the accumulated debris of their caves. It is a good thing that Mrs. Sin wasn't a tidy housekeeper, because her messy habit of letting things lie right where they fell has left us this bone-written record of the Ice Age animals they ate. That is the main source of information which scientists have for the antiquity of Peking Man.

They weren't exclusively meat-eaters, either. Of course, since roots and herbs don't have bones, we don't know very well what vegetables graced the Sinanthropus table. But Peking Man apparently did have a great fondness for one

HOME

A cave in the Western Hills at Choukoutien, in northern China, where the story of the life of early Peking Man has been preserved. The charred bones of large animals indicate that he probably cooked his food here. Cutting and scraping implements of quartz found in the ashes give an idea of the early stage of cultural development of their maker.

MAN-MADE

Flint tools made by Peking Man are rough, but effective. As a tool-shaper, Sinanthropus showed himself very definitely human.

vegetable product that we of today would hardly regard as worth the bother of gathering and cracking. Along with the bones of his game animals (including other *Sinanthropi*) in the caves, there have been found great quantities of the hard shells of the small, nutlike oily seeds of the hackberry tree. Maybe these were the early equivalent of soybeans, present-day China's great source of food oil.

Those hackberry nutshells convey to scientists not only information regarding one item in Peking Man's diet, but also an important bit of climatological data. Hackberry trees belong to the temperate zone—they are common over a large part of the United States today. The hackberry evidence is backed up by the identification of a bit of charred wood as being from a redbud tree—again a member of the temperate zone flora.

To speak of the culture of civilization of Sinanthropus may seem a bit high-falutin', in the face of what we have seen of what he looked like and the way he lived. Yet he did have a definite culture level, even though an humble one. He knew how to make stone implements that could be used for cutting wood and flesh, digging in the earth, and possibly for hunting game and fighting with his own kind. Most important of all, he already knew the use of fire; and this discovery is rated by anthropologists as the greatest single step forward in the history of the whole human race.

So take him as you find him, beetle brows, thick neck, cannibalism and all, old *Sinanthropus pekinensis* wasn't the kind of a grandfather who'd thank any of his descendants for being ashamed of him. With all his faults, he certainly was a man.

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Science News Letter, July 16, 1938

TECHNOLOGY

Compounded Wood Is New Milling Advance

THE old practice of veneering furniture, which turned out a mahogany table for $5, is back in a new and much more fundamentally important form.

Compounding wood, as the process of veneering is known to the trade, is now turning to the new field of making wooden beams which have all the uniformity of characteristics of steel and other metals. Do you wish a wood with a given density, a given elastic strength and other properties? Compounded wood is the answer and each time you place an order with the mills it comes through the same, time after time.

Wood unsuited for many construction purposes becomes the core of the plank and laminated layers supply the exterior. The proportions of each are varied so that the same characteristics can be repeated at will.

In part the use of phenolic resins as the gluing agent in the finished board is the difference between older veneer panels and the new beams of technologic mill working. The various layers of wood are arranged in "books", dried, coated with the resin, heated electrically and finally pressed at proper temperatures into finished lumber.

"These boards," states the Industrial Bulletin of Arthur D. Little, Inc., "meet predetermined specifications, with widths previously unavailable, and with a uniform adherence to specification comparable to that of the steel construction industry."

The resin used in the process impregnates the board with vapors which are obnoxious to fungi and thus the long-sought fungus-proof board is at hand.

Science News Letter, July 16, 1938

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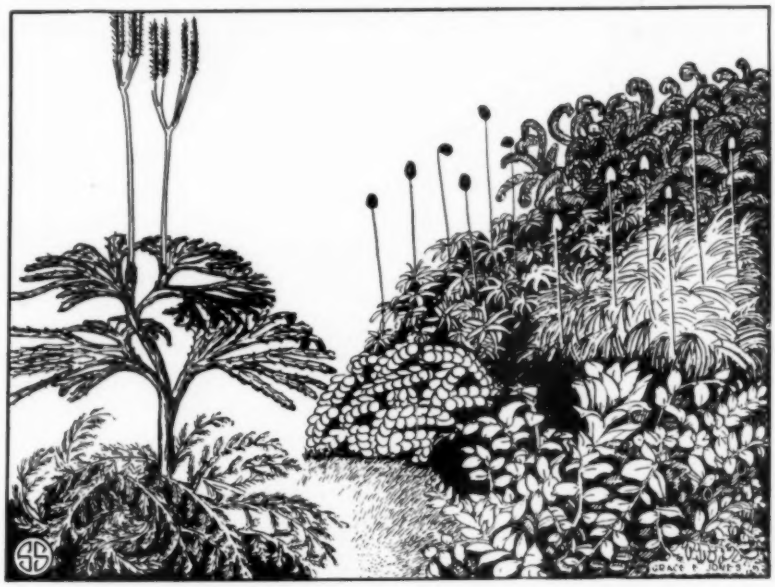
Mosses Are Easy To Keep But Not So Easy To Study

(Fifth of a series of 12 articles. Next week—Collecting Fungi)



MOSSES are easy to collect, easy to keep. To that extent they make very satisfactory hobby material. But they escape being a "snap" through at least medium difficulty in studying, because most of them are small, therefore requiring close examination with your hand-lens.

While mosses may be laid between the sheets of a regular plant press, usually this is not done. It is easier, and in the end just as satisfactory, to put them in small boxes or even in envelopes and let them dry that way. When you want to examine them at home or in camp, just take a bit off your specimen and soak it in water for a minute or two; it will then be fresh as new.

Take a good, generous pinch of any moss sod that interests you. Better take a little of whatever it is growing on, too. (This advice obviously doesn't hold, if the moss is growing on solid rock; but if it is on earth or tree bark, collection of the "substratum" is an easy matter.)

Moist, shady woodlands are the best collecting grounds for mosses, but some kinds can be found even in deserts, while in bogs the greater part of the soggy ground will be carpeted deeply with moss—usually sphagnum. Sphagnum moss keeps growing at its tips, while the dead lower ends of the stems pile into deep peat beds (the "turf" of Irish fireplaces). Ancient peat beds become lignite or brown-coal deposits.

When you are collecting your moss specimens, be sure to get them with the fruiting-bodies or capsules if you can. These capsules, which are the nearest things to flowers and seed-pods that the moss plant has, are botanists' principal means for identifying them. And even if you don't consult the books on the subject to find out exactly what are the names of your specimens, the capsules are very interesting little things to look at with your lens.

Not everything that is called a moss is really a member of the moss division of the plant kingdom. Almost any plant with closely crowded, tiny leaves, or with finely divided, hair-like branches is very likely to be called a moss, so that these "imitation" mosses range through all groups of plants.

The trailing "Spanish moss" of the South, that hangs on trees and telephone wires, is one of the higher plants—surprisingly enough, a member of the pineapple family. Up in the North Woods, the "beard moss" on the trees is really a lichen, member of a plant group lower than the mosses. "Reindeer moss" that grows in many forests, even in the South, is another lichen.

Most likely to fool you, however, are some of the moss-like members of the fern family, especially the ones called ground-pine and club-moss. They grow along with real mosses, look like them, but aren't mosses. Avoiding these botanical pitfalls is mainly a matter of living along with your mosses for a while and becoming acquainted with them.

For more information about collecting mushrooms and toadstools and a list of books and pamphlets on the subject, send us a postcard with your name and address. Ask for Bulletin 5. Address: Science News Letter, 2101 Constitution Ave., Washington, D. C.

Science News Letter, July 16, 1938

Earth Trembles

Information collected by Science Service from seismological observatories and relayed to the U. S. Coast and Geodetic Survey resulted in the location of the following preliminary epicenters:

Thursday, June 30, 11:45.6 a. m., E.S.T. **Pacific Ocean east of Australia and north of New Zealand. Latitude 24 degrees south, longitude 167 degrees east. Not detected by stations in the continental United States.**

For stations cooperating with Science Service in reporting earthquakes recorded on their seismographs see SNL May 21.

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ENGINEERING

Senate Safety-at-Sea Report Brings Better Fire Resistance

THE REPORT of the Technical Committee appointed by the Senate Safety-at-Sea Committee following the Morro Castle disaster in 1934 has resulted in important changes in American merchant ship design with new emphasis on safety, Commander Howard L. Vickery, assistant to Admiral Emory S. Land of the U. S. Maritime Commission, told International Conference of Naval Architects and Marine Engineers meeting in London.

American merchant vessels designed since the report was completed are better balanced when damaged than were previous designs. They frequently have more compartments and bulkheads, a safety factor of no mean importance. In addition, fireproof panels and bulkheads have been developed in tests conducted by the committee on the S. S. Nantasket, which should go a long way toward relegating holocausts like the Morro Castle disaster to long-distant memory.

Regulations worked out by the committee, the American merchant marine official and Navy officer declared, are in many cases more stringent than those set up by the International Convention on Safety-at-Sea in 1929.

The fire-resistant materials developed by the committee may add to the weight and cost of a ship, but will result in a greater margin of safety.

Prefabrication of the insulated steel panels may prove to be the way in which these new materials can be designed, he suggested. If this proves to be the case much woodworking equipment found in large shipyards for producing wooden panels will be immediately rendered obsolete.

Safety regulations governing many parts of a ship previously not considered have been studied. "The safety viewpoint taken regarding the machinery of the ship is that the derangement of even what may appear to be some minor part might render the ship helpless and so expose her to the elements as to endanger her," Commander Vickery said.

Science News Letter, July 16, 1938

METEOROLOGY

"Shapes" of Rainstorms Determine Their Effects

RAINSTORMS have shape and structure, and these determine to a large extent their effects for both good and ill. This has long been realized in a general way, but it has not been until lately that even an approximation of close study of these highly important meteorological phenomena has been possible.

At the recent national meeting of the American Meteorological Society, the subject was discussed by representatives of two different parts of the U. S. Department of Agriculture: Dr. Merrill Bernard of the U. S. Weather Bureau and Dr. C. W. Thornthwaite of the Soil Conservation Service.

One of the principal handicaps in the more minute study of rainstorm shape and structure has been the relatively wide spacing of observation points. The raingages and other instruments necessary for obtaining data have been located at cities scores or even hundreds of miles apart, with scattered supplementary stations maintained in smaller places by volunteer observers. Records have been taken, as a rule, only once or twice a day, so that a cloudburst of an inch in an hour might appear on the record as a 24-hour precipitation.

However, with the simultaneous advent of depression and drought, with relief consequently necessary for many farmers, the ill winds have been taxed for at least a modicum of scientific good. Weather-recording set-ups have been established in a thick network over a whole river watershed in Ohio, with a station kept by an instructed farmer about every four miles. Records can be taken every half-hour, or even every fifteen minutes.

It has thereby become possible, after assembling and digesting the vast masses of data in central computing offices, to learn where the rain has fallen thickest, and for how long. The extent and movements of the rainiest and the "driest" parts of a rainstorm have been traced, and quantitative figures of runoff, soil erosion, local floods, and other long-desired but hitherto unavailable data have been obtained.

Science News Letter, July 16, 1938

ZOOLOGY

Ten Enemies Oppose Man's Use of Wood Products

MAN'S use of wood throughout the world is in a continual battle with ten different kinds of wood-destroying enemies, it was reported at the Conference on Timber and Concrete sponsored by Massachusetts Institute of Technology.

When man uses wood in water, three marine animals lie in wait, said Prof. Charles H. Blake, assistant professor of zoology at M. I. T. They are: The famous shipworm, a small clam with an elongated giraffe-like neck; the gribble, a tiny gray shrimp-like animal only 3/16 of an inch long; and another shrimp-like animal known as *Chelura terebrans*.

On land six kinds of insects and one plant species are at hand seeking to destroy wood as man's construction material. The plant is the shelf or bracket fungus, which is related to the mushroom.

Among the insects are the two kinds of termites, the dry-wood and dampwood types. Then come three beetles: the death-watch beetle, whose ticking sound was once considered an ill omen; the false death-watch beetle, and the powder-post beetle. And finally there is the destructive carpenter ant, big and black, who excavates a series of broad passageways to serve as its dwelling.

Science News Letter, July 16, 1938

• Radio

Every Friday at 7:30 p. m. EDT, 6:30 p. m. EST, 5:30 p. m. CST, 4:30 p. m. MST, or 3:30 p. m. PST, Science Service cooperates with the Columbia Broadcasting System in presenting over the Columbia coast to coast network a new series of "Adventures in Science" presenting dramatizations of important scientific advances and discussions by eminent scientists.

CIGARETTES!

If you are just an average cigarette smoker you are probably wedded to one brand and may remain wedded to it after you've read our report on CIGARETTES in the July issue of CONSUMERS UNION REPORTS.

In spite of that, however, we think you'll find this report one of the most illuminating and interesting Consumers Union has ever published. In preparation for eight months, this report:

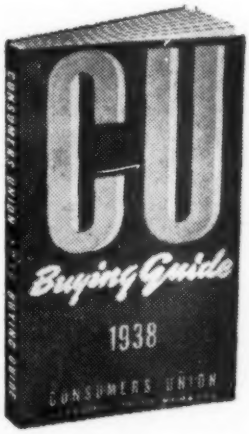
1. **Rates more than 40 brands, by name (including Camel, Chesterfield, Old Gold, and Lucky Strike), for nicotine content and strength;**
2. **Tells you the physiological effects of smoking;**
3. **Presents data from carefully controlled smoking tests and laboratory tests;**
4. **Gives facts about de-nicotinized cigarettes and about the new filter-holders advertised as de-nicotinizers;**
5. **Discusses methods of stopping smoking and gives six rules for "seeming to smoke" which will reduce the injurious effects of smoking to a minimum.**

Besides this report, the July issue also contains the results of laboratory and use tests on GASOLINES, SUNBURN PREVENTIVES, and several other products—with ratings *by brand name* as "Best Buys," "Also Acceptable," and "Not Acceptable." The report on GASOLINES shows how it is possible to make savings of from $15 to $50 on gasoline expenditures.

REFRIGERATORS!

Are you planning to buy a refrigerator? If so, you will find the results of tests on 1938 refrigerators, published in the June issue of CONSUMERS UNION REPORTS, indispensable in making your selection. They point the way to savings of from $20 to $40 on the purchase price alone and show which brands offer the most substantial annual savings on operating costs. Twenty models are rated in this report in the estimated order of their merit.

Another report in this same issue rates 17 brands of DOG FOOD as "Best Buys," "Also Acceptable," and "Not Acceptable," and discusses the proper feeding of dogs. If you have been led to regard canned dog foods as adequate feeding in themselves, you owe it to your dog to read this report. Still other reports in this issue cover MEN'S HANDKERCHIEFS, CANNED STRING BEANS, CANNED FRUIT SALAD, CLEANSING TISSUES, FRESH FRUITS & VEGETABLES, and other products.



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•First Glances at New Books

Anthropology

THE CHINESE PEOPLE: New Problems and Old Backgrounds—George H. Danton—*Marshall Jones,* 312 p., $3.50. An extremely readable book, telling plain and simple facts about Chinese psychology and Chinese life in general. The author feels that China will regain its own. Military power is a temporal thing; the essence of China will endure.

Science News Letter, July 16, 1938

Medicine

TUBERCULOSIS AND LEPROSY, THE MYCOBACTERIAL DISEASES—Forest Ray Moulton, ed.—*American Association for the Advancement of Science,* 133 p., $2.50. Papers by twenty-four specialists presented at Denver in June 1937, at the seventh symposium organized by the Section on Medical Sciences of the American Association for the Advancement of Science.

Science News Letter, July 16, 1938

Botany

ALASKA WILD FLOWERS—Ada White Sharples—*Stanford Univ. Press,* 156 p., illus., $3. The shortness of the Alaskan summer is compensated for by the richness of the flora called forth from its soil by the long-shining sun. It is a fine thing, especially for those fortunate enough to be able to make a summer voyage to Alaska, to have this well-illustrated regional flora available.

Science News Letter, July 16, 1938

Physiology

EAT AND KEEP FIT—Jacob Buckstein—*Emerson Books,* 128 p., $1.

Science News Letter, July 16, 1938

Physics

ATOMS, ROCKS AND GALAXIES: A SURVEY IN PHYSICAL SCIENCE—John Stuart Allen and others—*Harper,* 474 p., illus., $3. The science faculty of Colgate University collaborate excellently in devising an adequate text for the newer college science survey courses. Superior illustrations lend value, and the good index will help make the book a reference work for students.

Science News Letter, July 16, 1938

Radio

BOTH SIDES OF THE MICROPHONE: Training for the Radio—John S. Hayes and Horace J. Gardner—*Lippincott,* 180 p., $1.25. General information, for those ambitious to enter the radio world and for those who enjoy listening to radio and therefore may want to know how programs are produced for them. An attractive feature of the book is the series of chapters by Guy Lombardo, Kate Smith, and other experienced radio performers.

Science News Letter, July 16, 1938

Engineering—Economics

HOUSING COMES OF AGE—Michael W. Straus and Talbot Wegg—*Oxford U. Press,* 259 p., illus., $2.75. The story of the New Deal's efforts in the direction of public housing, as told by two officials of the PWA Housing Administration, before the United States Housing Authority was created. Compact, reasonably complete account of one phase of the public housing question in the United States.

Science News Letter, July 16, 1938

Economics

THE CHALLENGE OF HOUSING—Langdon W. Post—*Farrar & Rinehart,* 309 p., $4. The former chairman of the New York City Housing Authority and Tenement House Commissioner criticizes here the home ownership drive of the Federal Housing Administration.

Science News Letter, July 16, 1938

Ethnology

FOLK-SONGS FROM THE SOUTHERN HIGHLANDS—Mellinger Edward Henry, ed.,—*Augustin,* 460 p., $5.50. A collection of 180 ballads and songs, with notes and comments and occasionally a line of the music. Much interest has been aroused in the retention of Scottish and English culture traits among the people of America's southern Appalachian Mountains, and their quaint folk-songs strikingly show old survivials.

Science News Letter, July 16, 1938

History

THE STORY OF ALASKA (Rev. ed.)—Clarence L. Andrews—*Caxton,* 303 p., $4. From the Russian discovery voyages to the Alaska of the future, this account presents the colorful, often amazing story of the development of our most northern territory.

Science News Letter, July 16, 1938

Recreation

1937 YEARBOOK: PARK AND RECREATION PROGRESS—National Park Service—*Govt. Print. Off.,* 55 p., illus., 25 c. This constitutes the first of what is intended to be a series of annual yearbooks on developments in parks and other recreation areas. Especially striking are the advances recorded in the establishment and improvement of state parks.

Science News Letter, July 16, 1938

Ethnology

HISTORICAL AND ETHNOGRAPHICAL MATERIAL ON THE JIVARO INDIANS—M. W. Stirling — *Govt. Print. Off.,* 148 p., plates., 35 c. Mr. Stirling, who has studied the Jivaros in their own jungle home, presents here most of the early source materials on this tribe. A good deal of the material has not heretofore appeared in English.

Science News Letter, July 16, 1938

Anthropology

I AM A MAN: THE INDIAN BLACK HAWK—Cyrenus Cole—*State Historical Soc. of Iowa,* 312 p., $3. The title comes from Black Hawk's famous speech to President Jackson, and it is appropriate for this study of an Indian who had so much more to his character than his fighting fame would show.

Science News Letter, July 16, 1938

Photography

THE FUN OF PHOTOGRAPHY—Mario and Mabel Scacheri—*Harcourt, Brace,* 374 p., illus., $3.50. A profusely illustrated non-technical work stressing picture taking rather than the trick effects that can be attained in the darkroom.

Science News Letter, July 16, 1938

Medicine

A SYMPOSIUM ON CANCER—Leiv Kreyberg and others—*Univ. of Wisconsin Press,* 202 p., $3. Interesting and important papers read before the Cancer Institute held under the auspices of the School of Medicine of the University of Wisconsin in 1936.

Science News Letter, July 16, 1938

Child Study

A HANDBOOK OF METHODS FOR THE STUDY OF ADOLESCENT CHILDREN—William Walter Greulich and others—*Society for Research in Child Development,* 406 p., $2.25.

Science News Letter, July 16, 1938

Physiology

PHYSICAL AND HEALTH EDUCATION: PRINCIPALS AND PROCEDURES—Helen Norman Smith and Helen Leslie Coops—*American Book,* 322 p., $2.25. A text for college use that aims to standardize terminology and clarify the relationships between the fields of health and physical education.

Science News Letter, July 16, 1938

Zoology

ANIMALS IN BLACK AND WHITE—Eric Fitch Daglish—*Morrow,* 255 p., illus., $2.50. A picture-book of animals for children, by a British artist-naturalist.

Science News Letter, July 16, 1938